REMARKS

Claims 1-20 are all the claims pending in the application and stand rejected.

By this Amendment, Applicant amends claims 1, 6, 10, 14 and 20 to further clarify the invention. No new matter is added. Support for the amendments is found, *e.g.,* at pages 4-5 of the specification as filed.

Reconsideration and allowance of claims 1-20 are respectfully requested in view of the following remarks.

I. Preliminary Matters

As preliminary matters, Applicant thanks the Examiner for accepting the drawings filed on March 26, 2004 and for acknowledging receipt of the claim for priority and receipt of the certified copy of the priority document.

II. Summary of Office Action

The Examiner withdrew the previous grounds of rejection. The Examiner, however, found new grounds for rejecting the claims. Specifically, the Examiner rejected claims 18-20 under 35 U.S.C. § 112, first paragraph. Claims 1-17, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,483,846 to Huang et al. (hereinafter "Huang") in view of U.S. Patent No. 6,754,226 to Nakano (hereinafter "Nakano"). Claims 18 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Nakano and further in view of U.S. Patent No. 6,505,247 to Steger et al. (hereinafter "Steger").

III.   Rejections under 35 U.S.C. § 112

Claims 18-20 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply

with the written description requirement. The Examiner alleges that the specification does not

properly describe that only updated data of the real-time data packets is transmitted in the

transmission cycles, as recited in claim 18. As a result, the Examiner contends that the

specification does not adequately describe the features described in claims 18 and 19. Applicant

respectfully submits that these claim features are expressly, implicitly, and/or inherently

supported by the specification.

The specification states:

> The application program can be composed of a plurality of
> different functions that work with different data sets at different
> times. **It is not necessary to call all the functions of the
> application program in each application cycle.** . . . [However, in
> the prior art] in cyclic real-time communication, **all the data of a
> peripheral image** have been **exchanged** in each communication
> cycle, regardless of whether the input data were processed or new
> output data generated in each application cycle.

See paragraphs [10] and [11] of the specification as filed.

The specification then describes an exemplary embodiment of the invention that aims to

overcome the above-noted disadvantage of the prior art. This exemplary embodiment comprises

various partial sequences.

> [These] various partial sequences are predefined for the partial
> cycle for the real-time communication. A transmission sequence to
> be processed in a current partial cycle is dynamically composed of
> the predefined partial sequences as a function of the cycle number.
> As a result, it is possible according to the invention that not all
> transmission sequences contain all the occurring data packets, but
> that **data packets whose user data has not changed can be
> omitted.**

See paragraph no. [15] of the specification as filed.

In other words, the specification clearly describes that only the data that has been changed, *i.e.,* only the updated data of the real-time data packets is transmitted in the transmission cycles, as recited in claim 18. Furthermore, the specification describes that "[t]he advantage of this arrangement is that <u>only necessary</u> transmission time for the real-time critical data traffic is used." *See* paragraph no. [28] of the specification as filed. Transmitting unchanged data as real-time data packets in the transmission cycle <u>is clearly omitted</u> at least in this exemplary embodiment of the specification.

Applicant thus respectfully asserts that "based on the planning of the real-time communication, only updated data of real-time data packets is transmitted in the transmission cycles" is adequately described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Applicant respectfully submits that withdrawal of the rejections of claims 18 and 19 under 35 U.S.C. § 112, first paragraph is proper.

Regarding claim 20, Applicant respectfully requests the Examiner to withdraw this rejection of the claim in view of the self-explanatory claim amendments being made herein.

IV.   Rejections under 35 U.S.C. § 103(a)

A.   *Claims 1-17 and 20*

Claims 1-17 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Nakano. Applicant respectfully traverses this rejection because the references fail to teach or suggest all of the unique elements as set forth and arranged in the claims.

For example, independent claims 1, 6, 10, and 14 *inter alia* and in some variation recite: "determining a cycle number of a particular transmission cycle." The Examiner contends that Huang teaches this unique feature of the independent claims at col. 5, lines 34-40. *See* pages 3-6 of the Office Action. Applicant respectfully disagrees.

In Huang, "[a] bandwidth partition scheme is implemented such that for a given repetitive cycle of time . . . a deterministic schedule for packets in the real time queue [is implemented]." *See* col. 5, lines 34-37. Huang is silent about <u>determining a cycle number</u> of a particular transmission cycle, as recited in claims 1, 6, 10 and 14. Instead, Huang discloses that the packets are transmitted during a repetitive cycle of time. *See* col. 5, lines 34-41. However, simply from the disclosure of a determination of a schedule for packets in the real time queue, it cannot be inferred that a cycle number is also determined, as recited in claims 1, 6, 10, and 14.

By contrast, in Huang, there is even no need to determine the cycle number because the only condition for the transmission of the data packets that are scheduled in the real time queue is the <u>repetition of the cycle</u>. In Huang, "[d]uring each cycle, a first time interval is provided for real time data packet traffic using a deterministic scheduling protocol such as by <u>passing a token</u>." *See* col. 2, line 67 - col. 3, lines 1-2. Thus, <u>independent from the number of cycles</u>, whenever the token is received in Huang, the data in the real time queue is transmitted. Consequently, Huang does not teach or even suggest the above-noted unique features of claims 1, 6, 10 and 14.

In addition, claims 1, 6, 10, and 14 *inter alia* and in some variation recite: "wherein the transmission sequence is composed of one or more partial sequences, the composition of which

depends on the determined cycle number, and wherein the cycle number determines which of the partial sequences are transmitted in the particular transmission cycle." The Examiner acknowledges that Huang fails to disclose or suggest this unique feature of claims 1, 6, 10, and 14 but cites Nakano for allegedly curing the above-identified deficiency of Huang. *See* pages 3, 5, 6, and 7 of the Office Action. Applicant respectfully disagrees.

Nakano teaches a method for detecting the format of data when data is absent from the transmission packets. *See* Abstract. Specifically, in Nakano, "the number of channels allocated for isochronous communication" is tracked for the transmission of real time data. *See* col. 5, lines 34-39. "A predetermined number of channels (or bands) are reserved for Iso packets in every communication cycle." *See* col. 5, lines 2-4. "[A] bit between offset 224h and 228h [in a register] corresponds to channel numbers 0 to 63, respectively. If a bit is set to zero, it indicates that the channel has already been allocated." *See* col. 5, lines 36-39.

In other words, Nakano does not disclose or even remotely suggest any mechanism in which the cycle number determines which channel is allocated for isochronous communication in a particular communication cycle. By contrast, a predetermined number of channels is always reserved and whenever the channel is allocated, the real time data for this channel is transmitted in each communication cycle. *See* col. 5, lines 2-6. In short, in Nakano, the cycle number is irrelevant to the transmission of Iso packets and Async (asynchronous) data packets. In Nakano, the data of a particular channel is transmitted in the particular cycle regardless of the cycle number. Nakano does not cure the above-identified deficiencies of Huang.

Therefore, "determining a cycle number of a particular transmission cycle…wherein the transmission sequence is composed of one or more partial sequences, the composition of which depends on the cycle number determined for the particular transmission cycle, and wherein the cycle number determines which of the partial sequences are transmitted in the particular transmission cycle," as set forth in some variation in claims 1, 6, 10, and 14 is not disclosed or suggested by the combined teachings of Huang in view of Nakano. The references do not disclose or even remotely suggest determining a cycle number and, based on that cycle number, determining which partial sequences of the transmission sequence to transmit.

Together, the combined teachings of these references would not have led the artisan of ordinary skill to have achieved the subject matter of independent claims 1, 6, 10, and 14. Therefore, Applicant respectfully requests that the rejection of claims 1, 6, 10 and 14 under 35 U.S.C. § 103(a) be reconsidered and withdrawn. Since claims 2-5, 7-9, 11-13, 15-17, and 20 depend on claims 1, 6, 10 and 14, respectively, they are patentable at least by virtue of their dependency.

In addition, dependent claim 20 recites: "wherein the conditional control commands utilize the cycle number to identify which ones of the partial sequences are to be transmitted in the particular cycle." The Examiner acknowledges that Huang does not disclose or suggest the unique features of claim 20. The Examiner, however, alleges that Nakano cures the above-identified deficiency of Huang (see page 8 of the Office Action). Applicant respectfully disagrees.

The Examiner relies on col. 5, lines 31 to 39 of Nakano as allegedly disclosing the above-quoted unique features of claim 20. Col. 5, lines 31 to 39 of Nakano recites:

> While each device has the CSR architecture shown in FIG. 5, only
> devices containing an isochronous resource manager have a valid
> bandwidth available register. The bandwidth available register
> tracks the number of channels allocated for isochronous
> communication. Each bit between offset 224h and 228h
> corresponds to channel numbers 0 to 63, respectively. If a bit is set
> to zero, it indicates that the channel has already been allocated.

As is visible from the above-quoted passage of Nakano, there is no disclosure or suggestion of conditional control commands. Furthermore, there is no disclosure or suggestion of utilizing the cycle number to identify which ones of the partial sequences are to be transmitted in the particular cycle, as explained in greater detail above. In short, Nakano does not cure the above-identified deficient disclosure of Huang. For at least these additional exemplary reasons, claim 20 is patentable over Huang in view of Nakano.

B.   Claims 18 and 19

Claims 18 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Nakano and further in view of Steger. Applicant respectfully traverses this rejection because the references fail to teach or suggest all of the elements as set forth and arranged in the claims.

Claim 18 and 19 depend on claim 1. Applicant has already demonstrated that Huang in view of Nakano does not meet all the requirements of independent claim 1. Steger is relied upon only for its alleged disclosure of transmitting only updated data of real-time data packets and that the real-time packets comprise a peripheral image, wherein unmodified portions of the peripheral

image are not transmitted in the real-time communication cycle (*see* page 8 of the Office Action)

and as such fails to cure the deficient disclosure of Huang in view of Nakano. Together, the

combined teachings of these references would not have led the artisan of ordinary skill to have

achieved the subject matter of claim 1. Since claims 18 and 19 depend on claim 1, they are

patentable at least by virtue of their dependency.

V.   Conclusion

In view of the above, reconsideration and allowance of this application are now believed

to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is

kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue

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                                                   Respectfully submitted,

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